

> Managing Information <

Infrastructures for Ambient Intelligence

Dennis Hollatz

INF-M3 - Anwendungen 2 - Wintersemester 2007/2008

15.01.2008

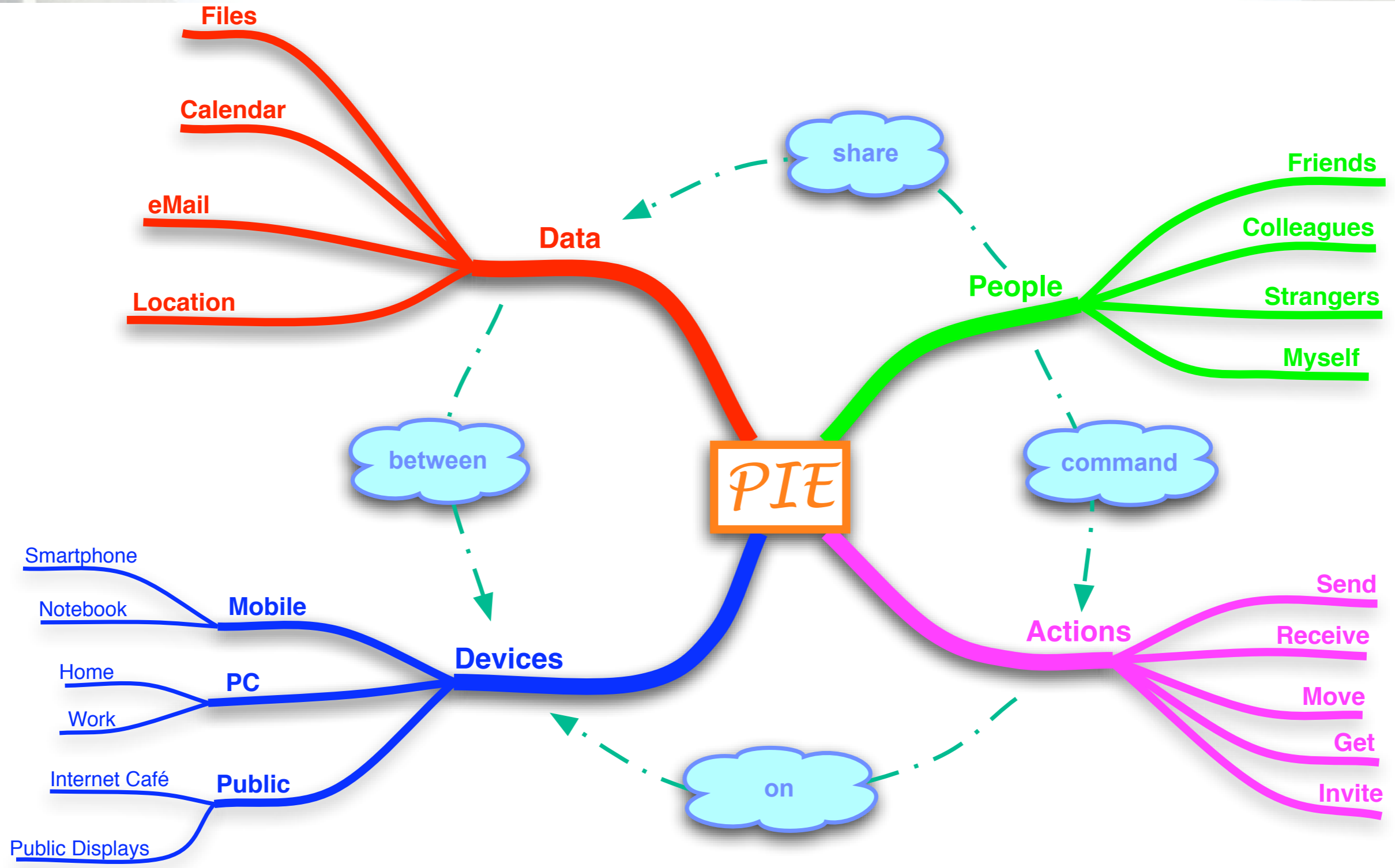
Agenda

- Introduction
- Key Requirements
- Current Work
- Resume

Basics

Requirements on Ambient Intelligence

- Access to my devices
- Access to foreign devices
- Routing capabilities for files and information
- Security



Goals for Aml

- Self configuring devices
- “Calm computing” [weiser 1995]
- Context Awareness

Architecture

- Client-/Server
- Peer-to-peer

Client/Server Architecture

- Benefits:
 - Easy to configure
 - Simple routing
- Drawbacks
 - Single point of failure
 - Additional hardware

Peer-to-Peer

- Benefits
 - robustness
 - performance
- Drawbacks
 - service discovery

Meta-Data

- What
- When
- Where (Source/Destination)
- How long
- ...

Data

- Files
- Information

Communication & Exchange

Requirements

- Service Discovery
- Service Propagation
- Exchange of meta data
- Exchange of files and information

Two Levels of Service Discovery

- First Level:
Access to the Network
- Second Level:
Offering and Consuming Services

EventHeap

- Part of iROS
- Blackboard
- Services announced on central instance
- events are interpreted by devices

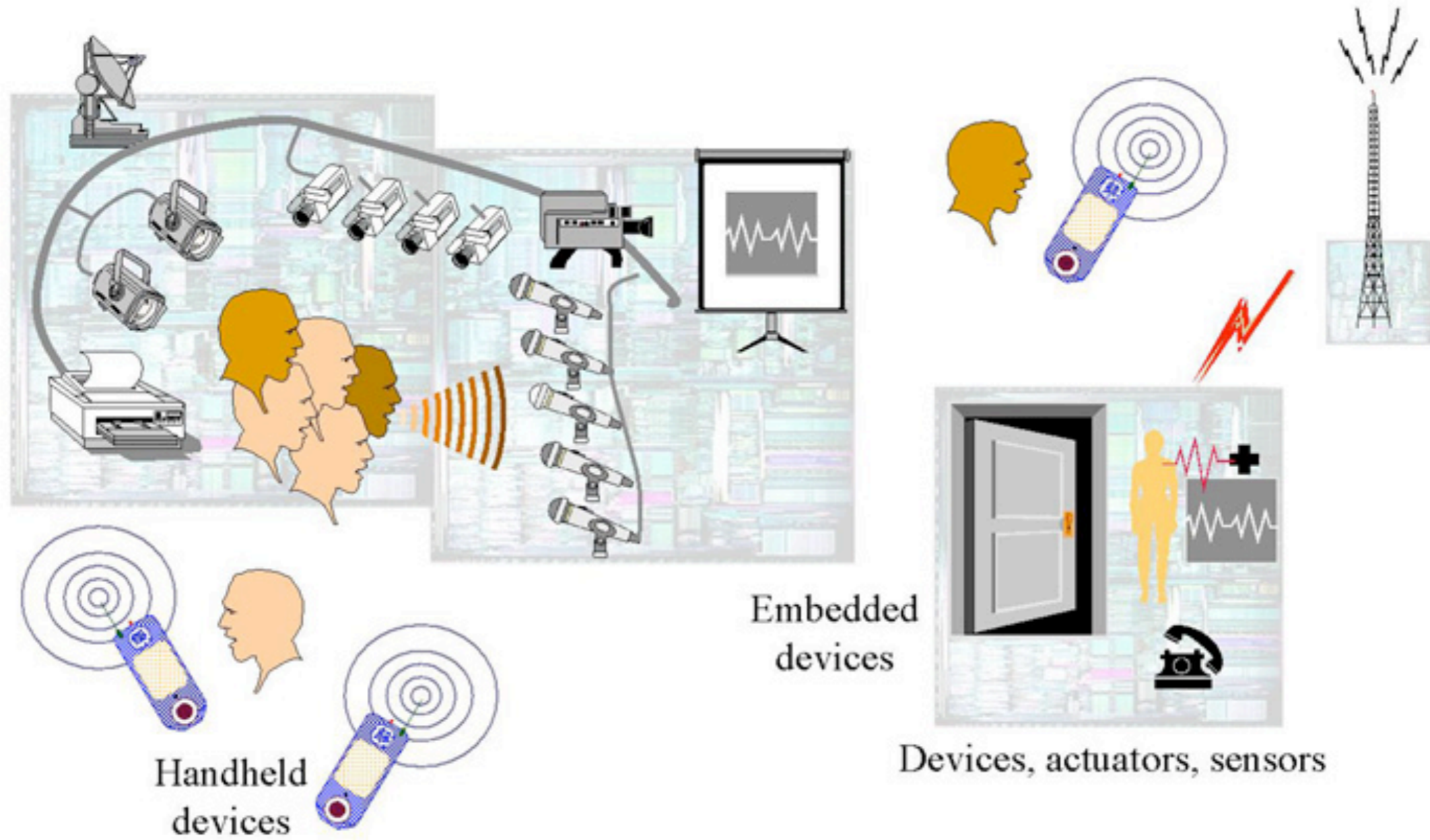


Key: **Stanford iROS** Application Developers **Other Infrastructure**

EventHeap - consideration

- Positive
 - events interpreted by clients
 - flexible, robust
- Negative
 - events interpreted by clients
 - server as bottleneck

Oxygen



Oxygen

- Vision (?) of Human Centered Computing
- Stationary devices, hand-held devices, infrastructure, networks, software architecture
- Automation, collaboration

Oxygen - consideration

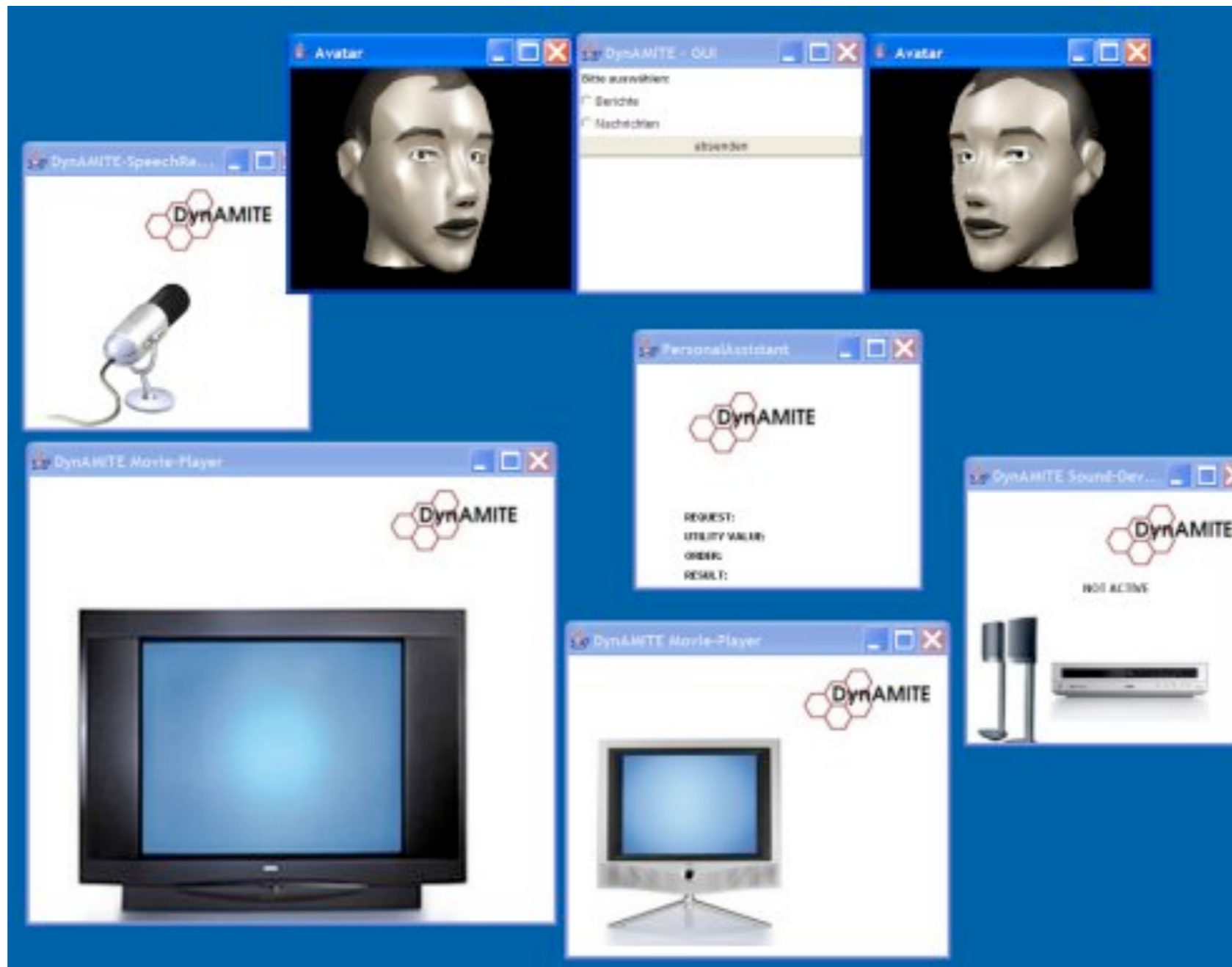
- Benefits
 - Complete concept for pervasive human centered computing
- Drawbacks
 - Software not available (?)

Dynamic Adaptive Multimodal IT-Ensembles



- Intelligent multimodal interaction
- distributed networked devices
- dynamical changeable ensembles

DynAMITE - Entertainment Demo



<http://www.igd.fhg.de/igd-a1/dynamite-project/english/index.html>

DynAMITE

- Decentralized middleware
- Self-organizing device ensembles
- Peer-to-peer

DynAMITE - consideration

- Benefits
 - Self-configuring environment
 - Conflict resolution
- Drawbacks
 - Clients have to be rather “smart”
 - Communication via broadcasts (?)

Jadex / Agent based Middleware

- Smart Agents
- Jadex executes Agents
- Communication via Messages/Events


Agent based Middleware - consideration


- Benefits
 - “pluggable” intelligence
 - standardized communication
 - peer to peer possible
- Drawbacks
 - heavyweight clients


Other already discussed approaches

- CAMUS [urich2007]
- PIE [pierce2007]
- Distributed file systems [gaerner2007]


Bibliography


-  [Dreyer2007]
Dreyer, Markus: Your Home in Your Hand
– URL <https://users.informatik.haw-hamburg.de/~ubicomp/projekte/master07-08-aw/vortraege.html>. – in preparation


-  [Gaerner2007]
Gärner, Sven: Synchronisation und verteilte Dateisysteme,
– URL <https://users.informatik.haw-hamburg.de/~ubicomp/projekte/master07-08-aw/vortraege.html>. – in preparation

-  [Hellenschmidt2004]
Hellenschmidt, Michael and Kirste, Thomas: SodaPop: A Software Infrastructure Supporting Self-Organization in Intelligent Environments, Proc. of the 2nd IEEE Conference on Industrial Informatics, INDIN 04, Berlin, Germany, 24th-26th June, 2004. – URL <http://www.igd.fhg.de/igd-a1/dynamite-project/index.html> – date: Jan. 13th, 2008

Bibliography

-  [Oxygen]
The MIT Oxygen Project,
URL <http://oxygen.csail.mit.edu/>. – date: Jan. 14th 2008

-  [Kirste2004]
Thomas Kirste, DynAMITE - Dynamisch Adaptive Multimodale IT Ensembles,
Tagungsband: Forschungsoffensive "Software Engineering 2006"
Eröffnungskonferenz 1.-3. Juli 2004, Berlin, Germany
– URL <http://www.igd.fhg.de/igd-a1/dynamite-project/index.html>. – Jan. 10th 2008

-  [Pierce2007]
Pierce, Jeff and Nichols, Jeff: Personal Information Environments
– URL <http://www.almaden.ibm.com/cs/projects/pie/>. – Zugriffsdatum: 07.12.2007

Bibliography



[Urich2007]

Urich, Jaroslaw: Context-Awareness: aktuelle Projekte,

– URL <https://users.informatik.haw-hamburg.de/~ubicomp/projekte/master07-08-aw/vortraege.html>. – in preparation



[Weiser 1995]

Weiser / Brown: The Coming Age of Calm Technology, <http://www.ubiq.com/hypertext/weiser/calmtech/calmtech.htm>, 1995

Infrastructures for Ambient Intelligence

iROS DynAMITE Oxygen

EventHeap Agents

Your Home In Your Hand
Ambient Intelligence

SODAPOP peer-to-peer

Client/Server EventHeap

